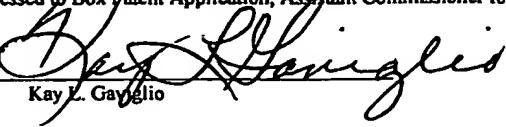


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Date: March 22, 1999

By:


Kay L. Gayglie

PATENT
Docket No. GC477C1

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Field of the Invention

The present invention relates to novel phenol oxidizing enzymes, in particular, novel phenol oxidizing enzymes derived from strains of *Stachybotrys* and novel strains of the genus *Stachybotrys* producing these enzymes. The present invention provides methods and host cells for expressing *Stachybotrys* phenol oxidizing enzymes as well as methods for producing expression systems. The present invention also relates to methods for modifying a colored compound and dye transfer prevention during fabric washing. Moreover the invention relates to an enzymatic detergent composition for stain bleaching or anti dye transfer.

Background of the Invention

Phenol oxidizing enzymes function by catalyzing redox reactions, i.e., the transfer of electrons from an electron donor (usually a phenolic compound) to molecular oxygen (which acts as an electron acceptor) which is reduced to H₂O. While being capable of using a wide variety of different phenolic compounds as electron donors, phenol oxidizing enzymes are very specific for molecular oxygen as the electron acceptor.

Phenol oxidizing enzymes can be utilized for a wide variety of applications, including the detergent industry, the paper and pulp industry, the textile industry and the food industry. In the detergent industry, phenol oxidizing enzymes have been used for preventing the transfer of dyes in solution from one textile to another during detergent washing, an application commonly referred to as dye transfer inhibition.

Most phenol oxidizing enzymes exhibit pH optima in the acidic pH range while being inactive in neutral or alkaline pHs.

Phenol oxidizing enzymes are known to be produced by a wide variety of fungi, including species of the genii *Aspergillus*, *Neurospora*, *Podospora*, *Botytris*, *Pleurotus*, *Fomes*, *Phlebia*, *Trametes*, *Polyporus*, *Rhizoctonia* and *Lentinus*. However, there remains a need to identify and isolate phenol oxidizing enzymes, and organisms capable of naturally-producing phenol oxidizing enzymes, which present pH optima in the alkaline range for use in detergent washing methods and compositions.